A 57. 46/3: MAY.-83

SHELVED WITH PERIODICALS

Montana State Library
3 0864 1004 8797 7

United States Department of Agriculture
Soil Conservation Service

Montana Agricultural Experiment Station

Bozeman, Montana

MONTANA WATER SUPPLY OUTLOOK

Snowpack and Streamflow Forecasts as of May 1, 1983

U.S. DOCUMENTS COLLECTION
MONTANA STATE LIBRARY

PLEASE RETURN

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
P.O. Box 98
Bozeman, Montana 59715

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

THIRD-CLASS BULK RATE
POSTAGE AND FEES PAID
USDA - SCS
BOZEMAN MT
PERMIT NO G-267

Document Distribution Center
Montana State Library
930 East Lyndale Avenue
Helena, MT 59620

****

The Montana Water Supply Outlook is a publication of the U.S. Soil Conservation Service. The SCS administers the Cooperative Snow Survey Program in cooperation with other federal, state and private agencies, organizations, and individuals.

The report is prepared by SCS, Snow Survey and Water Supply Forecast Staff, P.O. Box 98, Bozeman, Montana.

FEDERAL - STATE - PRIVATE
COOPERATIVE SNOW SURVEYS
Furnisher the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro electric power generation, navigation, mining and industry
"The Conservation of Water begins with the Snow Survey"

****

Snowpack begins to melt

The mountain snowpack continues to follow the pattern of earlier months. The southwest and northwest corners continue to receive good moisture, while other areas continue to have less than normal moisture in the mountains.

Daily reports from SNOTEL and snow pillows indicate most locations reached their maximum water content of the season near mid-April. Low and middle elevation sites show some melt during the last half of April, while higher elevations report only small losses due to melt. Presently, only the Red Rock and upper Madison drainages show above average snowpack. Near average snow cover is reported in Southwest and Northwest Montana. Central and north central areas show much less than average water stored in the mountain snowpack with some areas having as little as one-half their average amounts.

Additional snow surveys will be made near mid-May at a limited number of sites and this data will be combined with data from the 65 SNOTEL sites to evaluate changes in the mountain snowpack.

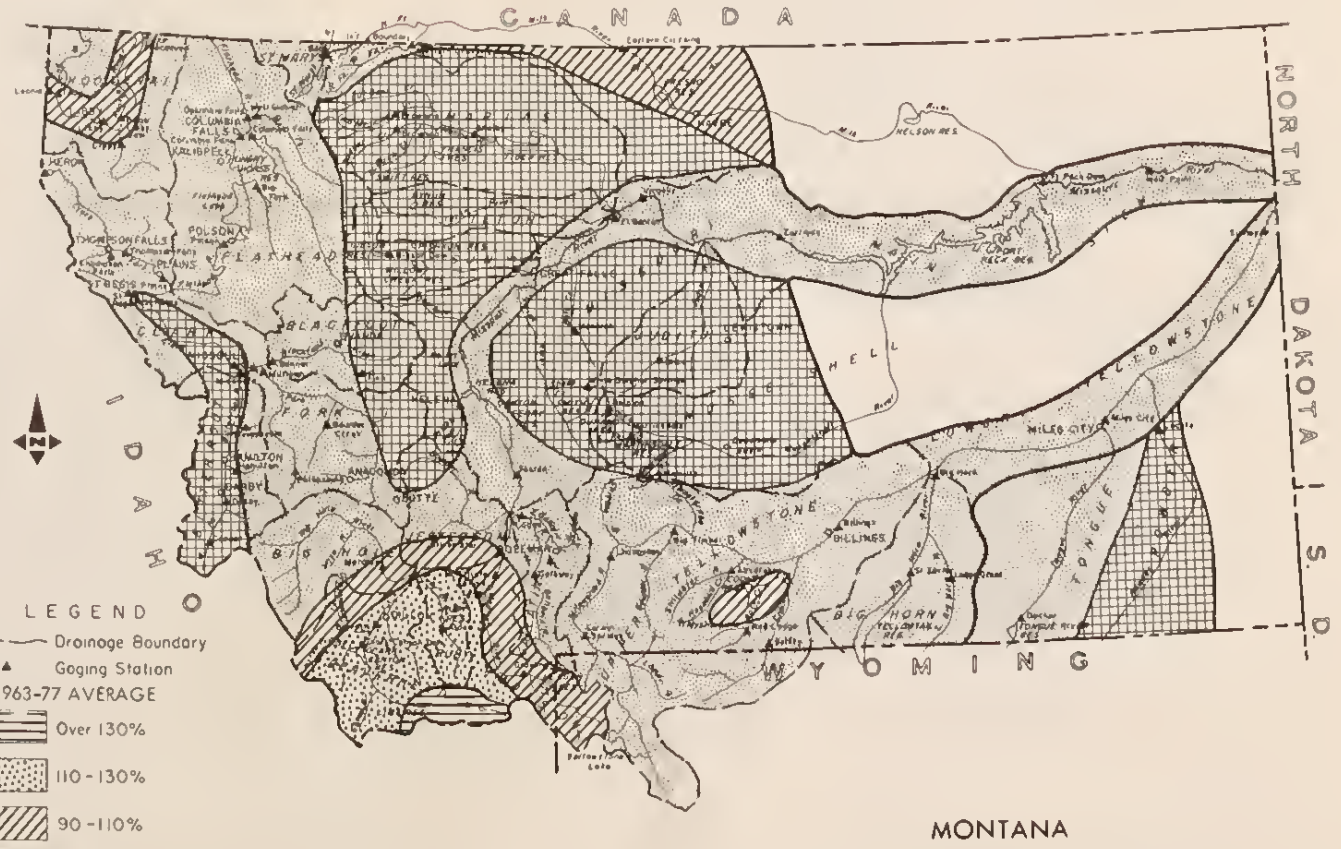
Shortages predicted

Most of Montana is facing a below average water supply this spring and summer. Forecasts have been lowered on most streams reflecting deficient April mountain moisture. With the exception of the Beaverhead, Ruby, and Madison Rivers, May through September runoff is forecast below to well below average. Irrigation water shortages will occur in many areas with some locations developing shortages as early as mid-June.

Peak snowmelt runoff in most drainages will be below average. Most streams should have their peak snowmelt runoff between mid-May and early June depending on their headwater elevation and snowpack levels.

Irrigation efficiency

With the predicted irrigation water supply shortages, now might be a good time to see if you can improve your irrigation efficiencies. The "washtub method" may provide a good index to irrigation scheduling. Check with your local Soil Conservation District or County Extension Office to see how a washtub can be used to improve irrigation water management on your unit.



MONTANA
PROSPECTIVE STREAMFLOW FORECASTS

Yellowstone River Drainage

STREAMFLOW FORECASTS

BASIN STREAM and/or FORECAST POINT	PERIOD	THIS YEAR FORECAST Thousand Acre Feet	THIS YEAR FORECAST Percent of Average	PAST RECORD THOUSAND ACRE FEET Last Year	PAST RECORD THOUSAND ACRE FEET Average	THIS YEAR FORECAST Thousand Acre Feet	THIS YEAR FORECAST Percent of Average	PAST RECORD THOUSAND ACRE FEET Last Year	PAST RECORD THOUSAND ACRE FEET Average
		May - September				May - July			
YELLOWSTONE RIVER at Corwin Springs		1700	84	2425	2,021	1400	84	1906	1,668
YELLOWSTONE RIVER near Livingston		1930	82		2,363	1580	81		1,941
BOULDER RIVER at Big Timber		317	78		404	292	79		370
STILLWATER near Absarokee (1)		540	85		634	455	86		528
CLARKS FORK RIVER near Belfry		495	79		623	440	81		543
ROCK CREEK near Red Lodge		STREAMFLOW MEASUREMENTS DISCONTINUED BY USGS							
INFLOW COONEY RESERVOIR near Boyd (2)		52.0	93		56.0	41.0	93		44.0
YELLOWSTONE RIVER at Billings		3596	81	4950	4,428	2973	80	4086	3,725
BIGHORN RIVER near St. Xavier (3)		1320	70	2051	1,887	1210	71	1628	1,714
LITTLE BIGHORN RIVER near Hardin		131	78		98.8	115	78	83.7	147
POWDER RIVER at Moorhead		116	52		221	102	50		202
YELLOWSTONE RIVER at Miles City (4)		5540	83		6,636	4700	82		5,737
TONGUE RIVER near Decker		190	73		262	170	72		236
YELLOWSTONE RIVER near Sidney (5)		5955	83		7,214	5160	82		6,212

(1) Adjusted for storage in Mystic Lake.
(2) Adjusted for storage in Cooney Reservoir.
(3) Adjusted for storage in Buffalo Bill, Boysen, Bull Lake, Pilot Butte and Bighorn Reservoirs.
(4) Adjusted for storage in Bull Lake, Buffalo Bill, Boysen, Pilot Butte, Bighorn and Tongue River Reservoirs.
(5) Adjusted for reservoirs shown in (4) and diversions into the Lower Yellowstone Canal.

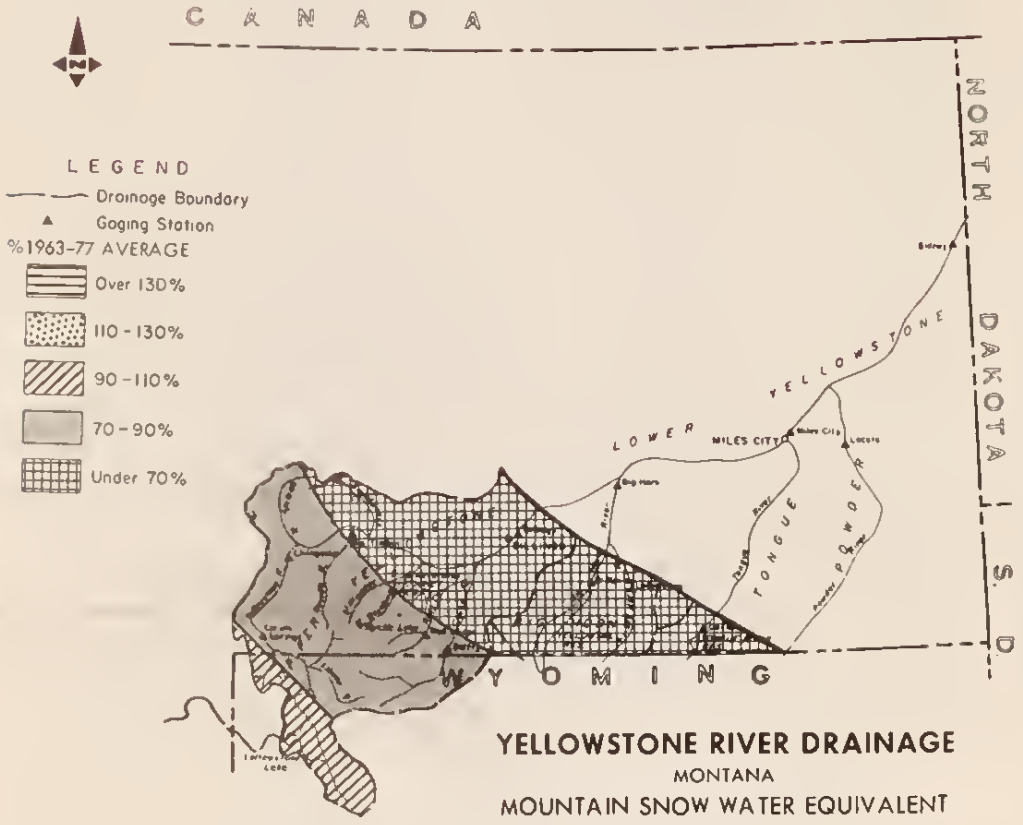
ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

PEAK FLOWS (MAXIMUM MEAN DAILY) (Av. flow for 24 hrs. on day of greatest flow)

FORECAST POINT	PEAK FLOW (SECOND FEET) Forecast Range	Average
YELLOWSTONE RIVER DRAINAGE		
Yellowstone River at Livingston	17,000 - 20,000	20,560
Boulder River near Big Timber	4,200 - 5,000	5,100
Stillwater River near Absarokee	5,000 - 6,500	6,261
Clarks Fork River near Belfry	5,500 - 7,000	7,342
Yellowstone River at Billings	35,000 - 43,000	39,188

*Highly abnormal weather during the critical melting period may cause the peaks to be outside the indicated range

Average based on 1963-77 period.



YELLOWSTONE RIVER DRAINAGE
MONTANA
MOUNTAIN SNOW WATER EQUIVALENT

SUMMARY of SNOW MEASUREMENTS
(COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN and/or SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF Last Year	THIS YEAR'S SNOW WATER AS PERCENT OF Average
Upper Yellowstone ab Livingston ..	14	68	77
Shields	8	70	73
Boulder & Stillwater	6	70	75
Rock Creek & Clark's Fork ...	15	84	85
Yellowstone (ab Bighorn River) .	43	74	79
Bighorn/Wyoming .	24	88	93
Little Bighorn ..	3	84	63
Bighorn (Total) .	27	88	89
Tongue	7	84	75
Powder	4	70	68
Yellowstone (Total)	81	78	81

WATER SUPPLY OUTLOOK
Expressed as "Poor, Fair, Average, Excellent" With Respect to Usual Supply

STREAM or AREA	Flow Period Spring Season	Flow Period Late Season
Yellowstone at Livingston	Fair	Fair
Shields	Fair	Fair
Boulder	Fair	Poor
Sweetgrass - Big Timber	Fair	Poor
Stillwater	Fair	Fair
Rock Creek	Fair	Fair
Clark's Fork	Fair	Fair
Yellowstone above Bighorn	Fair	Fair
Bighorn	Avg	Avg
Little Bighorn	Fair	Poor
Tongue	Fair	Poor
Powder	Fair	Poor
Lower Yellowstone ...	Fair	Fair

Snowpack remains below average

Water stored in the snowpack in the Yellowstone River and Bighorn River headwaters and in the drainages above Cooney Reservoir, is near to a little below average. However, all other areas have below to well below average snowpack. Many low and medium elevation snow courses recorded melt during April. Daily SNOTEL reports and snow pillow charts indicate the maximum water content of the snowpack occurred very near or soon after mid-April. Most mountain watersheds received below average precipitation last month.

Streamflow forecasts less than average

Most streamflow forecasts have decreased slightly from those issued last month. Runoff during April was about 80 to 85 percent average for most drainages.

This below average runoff is partially the result of deficient low elevation snow normally providing the early season runoff. Streamflows will increase with warmer weather.

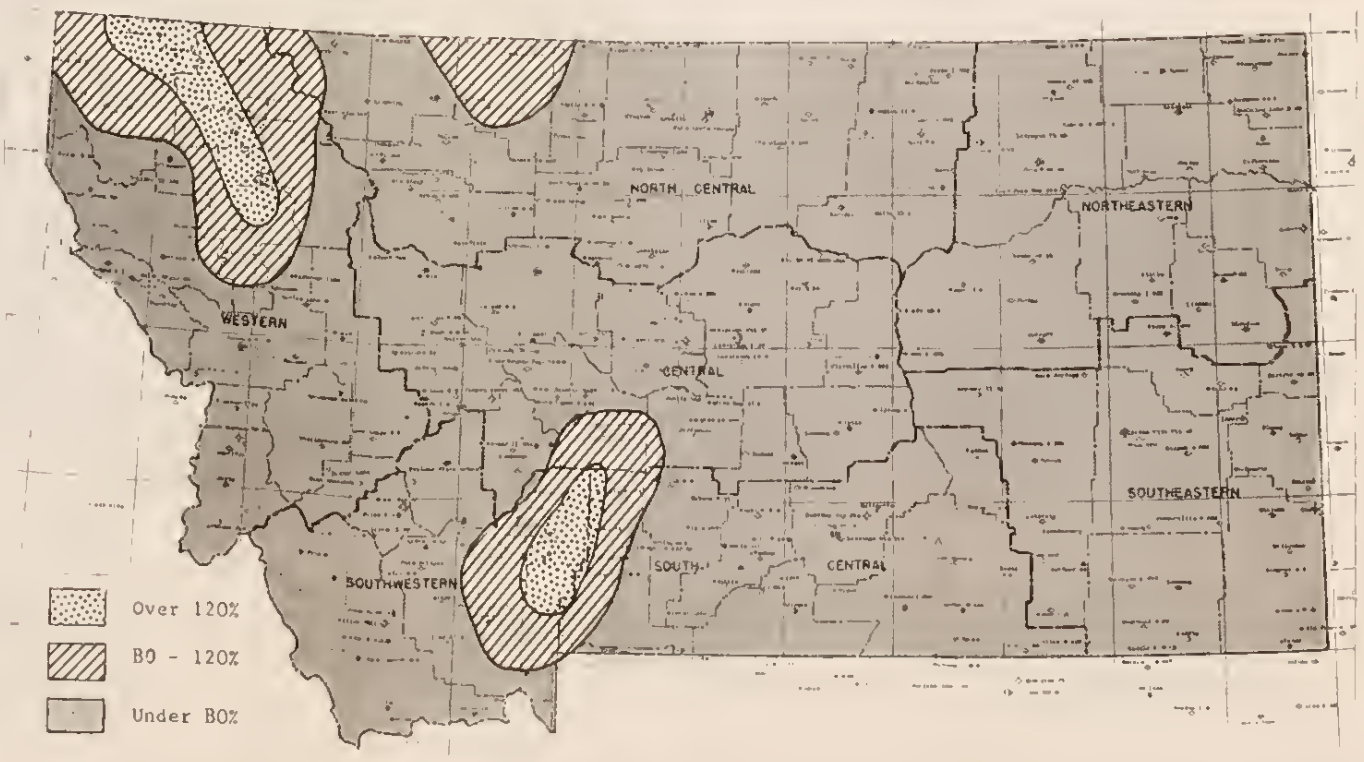
Based on present data, the peak snowmelt runoff on major tributaries and the Yellowstone River, should be less than average and should occur around the last week in May to the first week in June.

Water supply forecasts from May through September are generally 80 to 85 percent of average in the upper basin and somewhat less on tributaries entering downstream from Billings. Mid-to-late season shortages of irrigation water can be expected on tributaries not having stored water.

VALLEY PRECIPITATION

APRIL 1983

Source: NWS
Great Falls, MT



Missouri River & Hudson Bay Drainages

STREAMFLOW FORECASTS

BASIN STREAM and/or FORECAST POINT	PERIOD	THIS YEAR FORECAST Thousand Acre Feet	THIS YEAR FORECAST Percent of Average	PAST RECORD THOUSAND ACRE FEET Last Year	PAST RECORD THOUSAND ACRE FEET Average
RED ROCK RIVER near Monida (1)	May - September	130	147	126	88.5
BEAVERHEAD RIVER near Grant (2)		157	118	181	133
BEAVERHEAD RIVER at Barratts (2)		205	114		180
RUBY RIVER near Alder		109	114		96.0
BIG HOLE RIVER near Melrose		620	87		710
BOULDER RIVER near Boulder		STREAMFLOW MEASUREMENTS DISCONTINUED			
WILLOW CREEK near Harrison		21.9	115		19.0
MADISON RIVER near Grayling (3)		483	104	532	466
MADISON RIVER near McAllister (4)		798	102	940	783
GALLATIN RIVER near Gateway		455	84	568	542
INFLOW MIDDLE CREEK RESERVOIR near Bozeman (5)		22.4	78		28.7
HYALITE CREEK near Bozeman (6)		34.3	76		44.9
GALLATIN RIVER at Logan		432	74		580
MISSOURI RIVER at Toston (7)		2060	89	3116	2,314
SHEEP CREEK near White Sulphur Springs		12.0	56	23.6	21.3
SUN RIVER at Gibson Dam (8)		316	58	575	546
BELT CREEK near Monarch		77.0	56		137
MISSOURI RIVER at Fort Benton (9)		3085	85		3,613
TWO MEDICINE CREEK near Browning (10)		150	64		235
BADGER CREEK near Browning		79.0	64		124
MARIAS RIVER near Shelby		266	51	465	518
MISSOURI RIVER at Virgelle (11)		3360	80		4,189
MISSOURI RIVER near Landusky (11)		3785	83		4,553
NORTH FORK MUSSELSHELL RIVER near Delpine		2.6	49		5.3
SOUTH FORK MUSSELSHELL RIVER above Martinsdale		24.5	44		55.2
MISSOURI RIVER below Fort Peck Dam (11)		3400	80		4,253
MILK RIVER at Eastern Crossing		223	97		229
MILK RIVER at Eastern Crossing (12)		47.1	100		47.1
INFLOW LAKE SAKAKAWEA, ND (11)		9455	81		11,636
SASKATCHEWAN RIVER BASIN					
SWIFTCURRENT CREEK at Sherburne (13)		102	82	128	124
ST. MARY'S RIVER near Babb (13)		397	83		478
RED ROCK RIVER near Monida (1)	May - July	123	152	111	80.8
BEAVERHEAD RIVER near Grant (2)		133	121	148	110
BEAVERHEAD RIVER at Barratts (2)		176	117		150
RUBY RIVER near Alder		93.0	116		80.0
BIG HOLE RIVER near Melrose		570	88		648
BOULDER RIVER near Boulder		STREAMFLOW MEASUREMENTS DISCONTINUED			
WILLOW CREEK near Harrison		19.4	117		16.6
MADISON RIVER near Grayling (3)		368	104	404	353
MADISON RIVER near McAllister (4)		610	102	712	598
GALLATIN RIVER near Gateway		385	84	479	458
INFLOW MIDDLE CREEK RESERVOIR near Bozeman (5)		18.9	77		24.6
HYALITE CREEK near Bozeman (6)		29.3	76		38.5
GALLATIN RIVER at Logan		355	73		487
MISSOURI RIVER at Toston (7)		1745	88	2718	1,972
SHEEP CREEK near White Sulphur Springs		10.0	55	20.1	18.3
SUN RIVER at Gibson Dam (8)		280	56	523	497
BELT CREEK near Monarch		68.0	54		125
MISSOURI RIVER at Fort Benton (9)		2600	84		3,104
TWO MEDICINE CREEK near Browning (10)		140	63		221
BADGER CREEK near Browning		65.0	61		107
MARIAS RIVER near Shelby		245	52	438	474
MISSOURI RIVER at Virgelle (11)		2880	79		3,634
MISSOURI RIVER near Landusky (11)		3260	83		3,925
NORTH FORK MUSSELSHELL RIVER near Delpine		2.0	45		4.4
SOUTH FORK MUSSELSHELL RIVER above Martinsdale		22.0	43		51.3
MISSOURI RIVER below Fort Peck Dam (11)		2950	80		3,705
MILK RIVER at Eastern Crossing					
MILK RIVER at Eastern Crossing (12)					
INFLOW LAKE SAKAKAWEA, ND (11)		8450	81		10,425
SASKATCHEWAN RIVER BASIN					
SWIFTCURRENT CREEK at Sherburne (13)		87.0	81	113	108
ST. MARY'S RIVER near Babb (13)		335	82		407

(1) Adjusted for storage in Lima Reservoir.
(2) Adjusted for storage in Lima and Clark Canyon Reservoirs.
(3) Adjusted for storage in Hebgen Lake.
(4) Adjusted for storage in Hebgen Lake and Ennis Lake.
(5) Sum of West Fork Hyalite Creek and East Fork Hyalite Creek above the Reservoir.
(6) Adjusted for storage in Middle Creek Reservoir.
(7) Adjusted for storage in Lima, Hebgen, Ennis & Clark Canyon Reservoirs.
(8) Adjusted for storage in Gibson Reservoir & diversions.
(9) Adjusted for storage in Lima, Clark Canyon, Hebgen, Ennis, Gibson, Pishkun, Willow Creek & Canyon Ferry Reservoirs.
(10) Adjusted for storage in Two Medicine Reservoir & diversions in Two Medicine Canal.
(11) Adjusted for all upstream reservoirs.
(12) Flow at Eastern Crossing minus St. Mary's Canal.
(13) Adjusted for storage in Lake Sherburne.

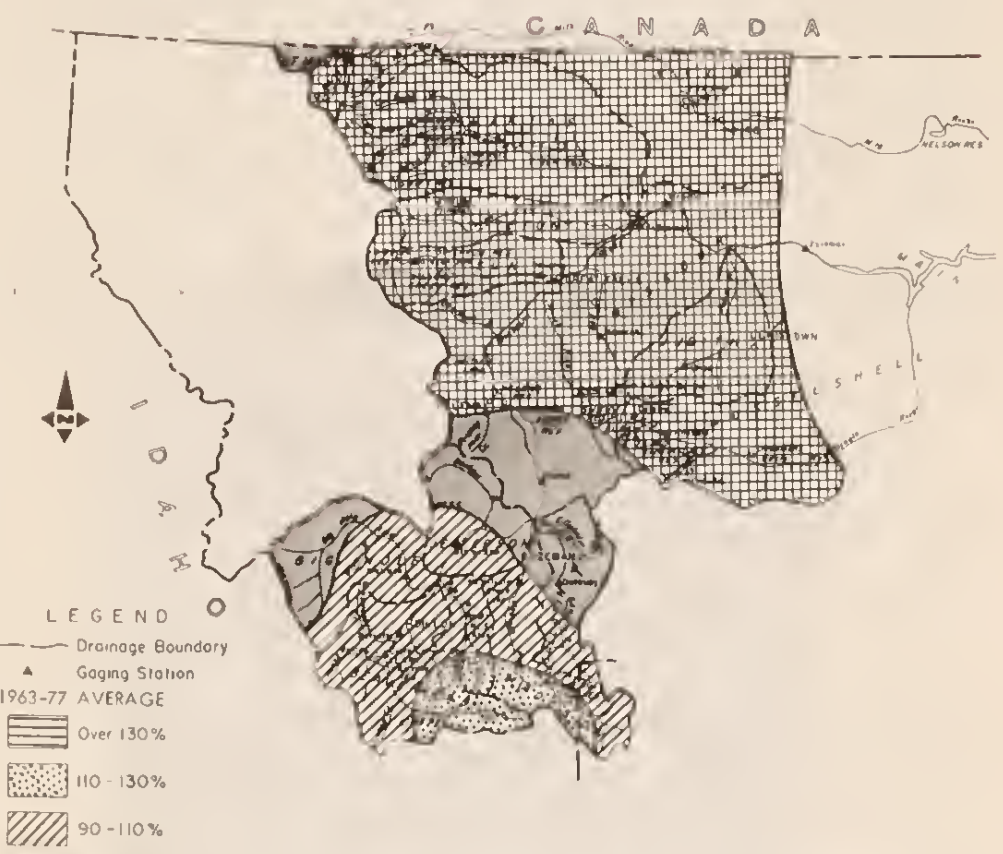
ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

PEAK FLOWS (MAXIMUM MEAN DAILY) (Av. flow for 24 hrs. on day of greatest flow)

FORECAST POINT	PEAK FLOW (SECOND FEET) Forecast Range	Average
MISSOURI RIVER DRAINAGE		
Big Hole River near Melrose	7,000 - 8,500	8,009
Gallatin River near Gateway	4,500 - 5,500	5,369
Gallatin River near Logan	4,400 - 5,800	5,324
Missouri River at Toston	16,000 - 20,000	18,005
Belt Creek near Monarch	800 - 1,400	1,742
Marias River near Shelby	2,000 - 4,000	12,720
S. Fk. Musselshell above Martinsdale	350 - 500	745

*Highly abnormal weather during the critical melting period may cause the peak to be outside the indicated range

Average based on 1963-77 period.



MISSOURI RIVER & HUDSON BAY DRAINAGES
MONTANA
MOUNTAIN SNOW WATER EQUIVALENT

Streamflow forecast lower

The water supply varies from above average in some parts of the Missouri headwaters to well below average in downstream tributaries. May through September runoff forecasts are generally lower than the forecasts issued last month. April runoff was generally a little below average in the upper reaches of the Missouri River. Some downstream tributaries had April runoff near 50 percent of average, reflecting deficient low elevation snow usually generating early season runoff.

Based on current conditions, peak snowmelt runoff is expected about average in the upstream areas and somewhat below average on downstream tributaries. The snowmelt peak should occur near late May on the Madison and Jefferson Rivers and early June on the Gallatin River. Most downstream tributaries should reach peak snowmelt runoff soon after mid-May.

Limited irrigation water shortages are expected on the Gallatin and Big Hole River drainages in the Missouri River headwaters by mid-July. Downstream tributaries could develop limited shortages by mid-June and severe shortages by early to mid-July. Stored water will help alleviate some water shortage on streams having irrigation reservoirs.

WATER SUPPLY OUTLOOK

Expressed as "Poor, Fair, Average, Excellent" With Respect to Usual Supply

STREAM or AREA	Flow Period: Spring Season	Late Season
Beaverhead	Exc	Avg
Ruby	Exc	Avg
Big Hole	Avg	Fair
Boulder	Fair	Poor
Jefferson	Fair	Fair
Madison	Avg	Avg
Gallatin	Fair	Fair
West Side Missouri	Fair	Poor
Smith-Belt	Poor	Poor
Sun	Poor	Poor
Teton	Poor	Poor
Marias	Poor	Poor
Judith	Poor	Poor
Musselshell	Poor	Poor
Milk	Fair	Poor
Bear Paws	Poor	Poor
St. Mary's	Fair	Fair

Increase in snow was limited

A few higher elevation snow courses in Southwest Montana showed an increase in water content during April. The maximum snow water equivalent for this season occurred near mid-April at almost all SNOTEL sites except for some high elevation sites in the southwest that reached their peak near the end of April. However, all other areas reported melt in lower and middle elevations and about the same amount of water stored in higher elevations as reported on April 1. Most areas show below average mountain precipitation for April.

The present snowpack varies from above average in the extreme southwest portion of the drainage to well below average in all areas north and east of Helena.

All snowpacks are isothermal and ready to melt when temperatures rise above freezing.

SUMMARY of SNOW MEASUREMENTS

(COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN and/or SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF: Last Year	Average †
Beaverhead	21	81	107
Ruby	11	89	108
Big Hole	22	74	93
Boulder	12	64	80
Jefferson	66	78	99
Madison	28	78	100
Gallatin	22	74	85
Missouri Headwater	116	77	96
West-side Missouri (Toston-Cascade)	9	62	74
Smith-Belt-Arrow	8	65	71
Missouri Main-stem	17	63	72
Teton & Sun	10	43	59
Marias	4	52	64
Marias-Teton-Sun	14	47	61
Judith-Musselshell	12	61	62
Milk	7	50	55
Bear Paws	6	52	43
Missouri (Total)	159	72	88
Saskatchewan			
St. Mary's	8	67	72
Bow River in Alberta	14	72	79

SNOW SURVEY DATA

SNOW May 1, 1983

DRAINAGE BASIN and/or SNOW COURSE NAME	Elevation	THIS YEAR Date of Survey	THIS YEAR Snow Depth (inches)	THIS YEAR Water Content (inches)	PAST RECORD Water Content (inches) Last Year	PAST RECORD Water Content (inches) Average
ABUNDANCE LAKE	8800	4/30	62	23.9	29.4	25.0
AMBROSE	6480	4/24	27	10.4	19.0	14.6
ARCH FALLS	7350	4/28	35	11.7	17.7	16.7
BADGER PASS	6900	4/30	66	29.2A	51.6	45.9
BADGER PASS PILLOW	6900	4/30	SP	26.4	47.8	-
BALD EAGLE PEAK	5700	4/28	122	58.9	81.9	65.4
BALD RIDGE	7500	4/26	29	9.4	17.0	14.7
BANFIELD MOUNTAIN	5600	4/28	53	23.9	31.8	24.4
BANFIELD MOUNTAIN PILLOW	5600	4/28	SP	20.7	24.5	20.5
BAREE CREEK	5500	4/28	97	43.7	55.7	49.5
BAREE MIDWAY	4600	4/28	76	29.9	38.6	35.1
BARFE TRAIL	3800	4/28	0	.0	3.7	1.8
BARKER LAKES PILLOW	8250	5/01	SP	19.6	20.2	-
BASIN CREEK	7130	4/29	37	11.3	14.0	10.6
BASIN CREEK PILLOW	7130	5/01	SP	11.0	13.6	-
BASSOO PEAK	5150	4/29	1	.5	4.4	7.7
BEAGLE SPRINGS	8850	4/29	36	11.5	15.2	-
BEAGLE SPRINGS PILLOW	8850	5/01	SP	9.7	13.0	-
BEAR BASIN	8150	4/27	55	21.5	28.5	25.6
BEAR PAW SKI AREA	5200	4/30	9	2.6	5.8	4.9
BEAVER LAKE	5900	4/30	38	14.3	31.5	25.9
BIG CREEK	6750	4/30	106	49.8	55.4	52.2
BIG SKY	7700	4/27	43	16.4	25.2	19.4
BIG SKY MEADOW	6350	4/27	18	6.6	11.3	3.9
BIG SNOWY	7150	4/25	40	14.9	22.0	28.0
BLACK BEAR	7950	4/28	104	48.5	59.6	45.4
BLACK BEAR PILLOW	7950	4/28	SP	39.2	52.2	40.9
BLACK MOUNTAIN	7750	4/28	51	17.2	23.1	-
BLACK PINE	7100	4/26	30	10.2	19.4	16.2
BLACK PINE PILLOW	7100	4/26	SP	10.8	19.8	16.7
BLOODY DICK	7600	4/27	37	13.4	18.7	15.7
BLOODY DICK PILLOW	7600	4/27	SP	12.2	15.4	-
BLUE LAKE	5900	4/30	40	17.0A	33.8	26.1
BOTS SOTS	8000	4/26	31	10.2	8.2	12.8
BOULDER MOUNTAIN	7950	4/25	58	21.2	27.1	23.4
BOULDER MOUNTAIN PILLOW	7950	5/01	SP	24.0	30.1	-
BOX CANYON	6670	4/29	17	6.2	10.9	8.5
BOX CANYON PILLOW	6670	5/01	SP	4.4	9.5	-
BOXELDER CREEK	5100	4/30	7	1.8	5.2	6.4
BRANHAM LAKES	8850	5/02	88	38.5	42.8	36.4
BRIDGER BOWL	7250	4/29	59	24.0	32.7	34.3
BRIDGER BOWL PILLOW	7250	4/29	SP	23.6	32.1	32.8
BRISTOW CREEK	3900	4/28	0	0.0	7.9	2.1
BRUSH CREEK TIMBER	5000	4/28	21	6.6	9.4	8.1
BULL MOUNTAIN	6600	4/27	10	3.2	9.1	3.3
CABIN CREEK	5200	4/27	4	.4	6.2	2.2
CALL ROAD	8050	4/29	40	14.2	17.0	14.6
CALVERT CREEK	6450	4/28	27	10.0	14.2	11.3
CALVERT CREEK PILLOW	6450	4/26	SP	5.2	8.8	1.9
CAMP MISERY	6400	4/29	134	55.2	57.6	55.4
CAMP SENIA	7990	4/26	26	8.6	5.8	10.9
CARROT BASIN	9000	4/25	97	42.4	54.3	44.4
CARROT BASIN PILLOW	9000	4/25	SP	38.9	40.0	33.5

SNOW May 1, 1983

DRAINAGE BASIN and/or SNOW COURSE NAME	Elevation	THIS YEAR Date of Survey	THIS YEAR Snow Depth (inches)	THIS YEAR Water Content (inches)	PAST RECORD Water Content (inches) Last Year	PAST RECORD Water Content (inches) Average
FRIDAY HILL	4620	4/28	42	17.8	24.6	-
FROHNER MEADOWS	6490	4/27	16	5.4	10.0	8.1
FROHNER MEADOWS PILLOW	6480	4/27	SP	8.0	11.2	9.2
GARVER CREEK	4250	4/28	13	5.4	10.8	5.4
GARVER CREEK PILLOW	4250	4/28	SP	6.5	9.0	4.9
GIBBONS PASS	7100	4/29	57	25.0	31.6	25.3
GOAT MOUNTAIN	7000	4/29	17	4.4	13.1	10.4
GOLD STONE	3100	4/27	49	18.4	24.4	20.5
GRASSHOPPER	7000	4/27	12	4.0	8.7	6.0
GRAVE CREEK	4300	4/28	35	14.1	17.4	16.0
GRAVE CREEK PILLOW	4300	4/28	SP	11.8	13.6	8.6
GRIFFIN CREEK DIVIDE	5150	4/29	18	6.1	11.9	8.5
GRIZZLY PEAK	8640	4/27	68	24.3	17.9	23.8
GUNSIGHT LAKE	6300	4/30	74	33.0	50.5	45.1
HAND CREEK	5030	4/28	35	11.0	14.8	7.7
HAND CREEK PILLOW	5030	5/01	SP	10.2	15.2	-
HAWKINS LAKE	6450	4/29	78	34.1	42.2	36.0
HAWKINS LAKE PILLOW	6450	4/28	SP	31.4	37.5	33.7
HEART LAKE TRAIL	4800	4/30	20	9.0	25.2	19.1
HEIGEN DAM	6550	4/27	31	12.2	13.3	8.3
HELL ROARING DIVIDE	5770	4/29	75	29.6	35.4	33.5
HERRIG JUNCTION	4850	4/26	68	25.3	34.4	-
HOLBROOK	4530	5/04	0	0.0A	5.0	2.8
HOOD MEADOW	6600	4/28	26	7.8	14.2	13.3
HOODOO BASIN	6000	4/30	96	45.7	68.5	55.6
HOODOO BASIN PILLOW	6000	5/01	SP	40.5	60.4	52.8
HOODOO CREEK	5900	4/30	90	41.4	61.8	52.0
ICEBERG LAKE #3	5600	4/27	54	21.1	33.1	35.1
INDEPENDENCE	7850	4/29	38	13.8	20.4	20.5
INTERGAARD	6450	4/28	19	5.2	12.2	9.5
JAHNKE LAKE TRAIL	7200	4/27	29	9.6	15.6	9.7
JOHNSON PARK	6450	5/03	0	0.0	6.4	2.8
JOSEPHINE LOWER #9	4900	4/26	28	10.9	19.4	19.1
KEELER CREEK	3300	4/28	0	0.0	4.9	1.8
KINGS HILL	7500	4/28	31	9.6	18.6	17.9
KRAFT CREEK PILLOW	4750	5/01	SP	.6	13.6	-
LAKE CREEK	6100	4/29	15	5.7	7.8	4.6
LAKEVIEW CANYON	6930	4/29	48	19.4	14.8	13.3
LAKEVIEW RIDGE	7400	4/29	42	17.3	14.1	11.3
LAKEVIEW RIDGE PILLOW	7400	5/01	SP	19.9	10.8	-
LEMHI PASS	7480	4/29	15	5.0	11.3	9.2
LEMHI RIDGE	8100	4/29	26	8.6	13.9	10.6
LEMHI RIDGE PILLOW	8100	4/29	SP	9.6	15.0	10.2
LICK CREEK	6860	4/28	27	9.4	13.2	11.2
LICK CREEK PILLOW	6860	4/28	SP	8.4	10.0	10.1
LITTLE PARK	7400	4/27	42	15.3	22.3	19.0
LOGAN CREEK	4300	4/28	4	1.0	6.3	3.0
LONE MOUNTAIN	8880	4/27	64	26.1	35.4	28.1
LOST HORSE	5940	4/27	62	26.8	48.9	35.8
LOST SOUL	4800	4/28	26	10.7	20.8	9.2
LOWER TWIN	7900	4/26	66	27.6	31.0	25.8
LOWER TWIN PILLOW	7900	5/01	SP	26.2	25.0	-
LUBRECHT FLUME	4800	5/02	0	.0	.7	0.9
LUBRECHT FLUME PILLOW	4800	5/01	SP	.0	2.8	0.6
LUBRECHT FOREST # 3	5450	5/02	0	.0	8.4	4.2
LUBRECHT FOREST # 4	4650	5/02	0	.0	.2	0.3
LUBRECHT FOREST # 6	4040	5/02	0	.0	.3	0.1
LUBRECHT HYDROPLOT	4200	5/02	0	.0	.0	0.3

SNOW May 1, 1983

DRAINAGE BASIN and/or SNOW COURSE NAME	Elevation	THIS YEAR Date of Survey	THIS YEAR Snow Depth (inches)	THIS YEAR Water Content (inches)	PAST RECORD Water Content (inches) Last Year	PAST RECORD Water Content (inches) Average
CASHE CREEK PILLOW	7800	5/01	SP	10.0	13.4	-
CEDAR GROVE	4100	4/28	0	0.0	14.3	7.5
CHESSMAN RESERVOIR	6200	4/27	9	2.3	5.0	3.5
CHICKEN CREEK	4060	4/26	8	1.4	11.1	-
CLOVER MEADOW	8600	4/29	53	20.8	25.4	21.7
CLOVER MEADOW PILLOW	8600	5/01	SP	13.6	23.5	-
COLE CREEK	7850	4/27	68	24.4	19.8	24.8
COLE CREEK PILLOW	7850	4/27	SP	23.1	18.2	22.5
COLLEY CREEK	6300	4/26	0	.0	10.5	6.3
COMBINATION	5600	4/26	3	1.0	7.2	3.0
COMBINATION PILLOW	5600	4/26	SP	.7	5.0	2.9
COOKE STATION	3150	4/28	49	18.8	28.0	22.7
COPPER BOTTOM	5200	5/01	0	.0	9.9	6.0
COPPER BOTTOM PILLOW	5200	5/01	SP	2.2	12.4	7.7
COPPER CAMP	6950	5/01	52	21.8	38.6	34.3
COPPER CAMP PILLOW	6950	5/01	SP	25.4	44.0	37.9
COPPER CREEK	5700	5/01	14	5.0	17.5	11.7
COPPER LAKE CREEK	6100	5/01	42	16.8	30.4	25.2
COPPER MOUNTAIN	7700	4/29	34	11.0	16.7	11.9
COTTONWOOD CREEK	6400	4/28	30	9.2	14.0	8.4
COYOTE HILL	4200	4/28	0	.0	8.0	3.8
CRYSTAL LAKE	6100	4/25	17	6.2	13.5	15.2
CRYSTAL LAKE PILLOW	5100	5/01	SP	6.0	10.0	-
DAD CREEK LAKE	8400	4/29	49	16.2	22.2	18.1
DAISY PEAK	7600	5/03	26	8.4	14.8	11.0
DALY CREEK	5730	4/24	27	10.4	18.7	13.8
DALY CREEK PILLOW	5730	5/01	SP	4.1	14.8	-
DARKHORSE LAKE	8600	4/30	68	26.6	37.7	31.8
DARKHORSE LAKE PILLOW	8600	5/01	SP	21.5	35.9	-
DAVIS CREEK	5400	4/28	54	24.7	31.8	24.5
DEADMAN CREEK	6450	4/28	20	6.7	10.4	10.1
DEADMAN CREEK PILLOW	6450	4/28	SP	5.6	10.5	7.6
DESERT MOUNTAIN	5600	4/28	34	13.1	18.6	15.1
DEVILS SLIDE	8100	4/28	64	23.4	30.8	29.3
DISCOVERY BASIN	7050	4/25	29	8.8	15.4	11.2
DIVIDE	7900	4/29	36	14.0	18.0	12.0
DIVIDE PILLOW	7900	4/29	SP	14.3	19.0	13.9
DIX HILL	6400	5/01	0	.0	9.5	5.1
EAST BOULDER S	9250	4/30	74	29.0A	41.5	36.5
EAST FORK R.S.	5400	4/28	0	.0	3.4	0.8
ELK HORN SPRINGS	7800	4/30	25	8.4	12.7	9.7
ELK PEAK	8010	4/27	44	15.4	21.9	21.4
EMERY CREEK	4350	4/28	26	10.6	15.9	4.7
EMERY CREEK PILLOW	4350	4/28	SP	12.8	13.4	-
FATTY CREEK	5500	4/30	52	21.8	31.4	25.5
FISH CREEK	8010	4/29	44	15.1	17.8	12.7
FISHER CREEK	2100	4/28	84	34.8	49.2	45.1
FISHER CREEK PILLOW	9100	4/28	SP	30.8	47.1	41.3
FIVE-MILE	5200	5/01	0	.0	6.8	5.3
FLATTOP MOUNTAIN PILLOW	6300	5/11	SP	42.2	51.7	54.8
FLEECER RIDGE	7500	4/27	32	9.9	15.4	10.6
FOOLHEN	8230	4/30	52	19.2	22.8	20.8
FOUR MILE	6200	4/26	27	9.1	12.0	8.5
FOURTH OF JULY	3450	4/28	0	.0	.0	-
FRED BURR PASS	8000	4/26	71	25.2	35.4	31.5
FREIGHT CREEK	6010	4/30	26	9.7	21.1	15.2

SNOW May 1, 1983

DRAINAGE BASIN and/or SNOW COURSE NAME	Elevation	THIS YEAR Date of Survey	THIS YEAR Snow Depth (inches)	THIS YEAR Water Content (inches)	PAST RECORD Water Content (inches) Last Year	PAST RECORD Water Content (inches) Average
MADISON PLATEAU	7750	4/28	61	27.2	33.2	23.5
MADISON PLATEAU PILLOW	7750	4/28	SP	26.2	31.4	24.9
MANY GLACIER	4960	5/01	32	14.7	23.4	-
MANY GLACIER PILLOW	4960	5/01	SP	3.4	19.5	-
MARIAS PASS	5250	4/29	34	12.0	24.0	17.8
MAYNARD CREEK	6210	4/29	39	13.3	18.2	16.5
MAYNARD CREEK PILLOW	6210	4/29	SP	11.2	14.2	13.9
MIDDLE MILL CREEK	7850	5/02	51	21.0	20.8	19.2
MILL CREEK	7500	4/26	26	6.3	16.1	15.3
MINERAL CREEK	4000	4/28	20	8.4	21.2	14.2
MONUMENT PEAK	8800	4/29	64	25.5	36.5	32.7
MONUMENT PEAK PILLOW	8800	5/01	SP	19.8	28.0	-
MOULTON RESEPVOIR	6950	4/27	18	5.6	10.5	-
MOUNT ALLEN #7	5700	4/26	92	40.1	53.8	49.6
MOUNT LOCKHART	6400	4/30	43	17.2	32.0	23.3
MOUNT LOCKHART PILLOW	6400	4/30	SP	17.0	30.0	22.6
MUDD LAKE	7650	4/28	48	19.8	27.0	22.5
MULE CREEK	8300	4/30	45	15.7	22.7	-
MULE CREEK PILLOW	8350	5/01	SP	15.5	21.8	-
NEVADA CREEK	6480	5/01	26	8.8	17.4	-
NEVADA CREEK PILLOW	6480	5/01	SP	12.3	19.0	-
NEWTON MOUNTAIN	5600	4/28	97	41.3	46.0	-
NEZ PERCE CAMP	5650	4/25	26	10.0	22.6	13.6
NEZ PERCE CAMP PILLOW	5650	4/25	SP	11.5	20.0	-
NEZ PERCE CREEK	6530	4/29	13	4.0	8.1	5.3
NEZ PERCE PASS	6570	4/25	29	12.0	25.0	17.4
NOISY BASIN	6040	4/28	130	53.4	52.9	52.1
NOISY BASIN PILLOW	6040	5/01	SP	50.4	48.3	45.5
NORTH FK. ELK CREEK	6250	5/02	19	7.6	18.8	11.5
NORTH FK. ELK CREEK PILLOW	6250	5/01	SP	6.8	17.3	11.8
NORTH FORK JOCKO	6330	5/01	79	34.8	55.3	49.1
NORTH MEADOW	7500	4/26	33	11.5	12.8	11.4
NORTHEAST ENTRANCE	7400	5/05	0	0.0	9.0	8.5
NORTHEAST ENTRANCE PILLOW	7410	5/01	SP	5.3	9.0	8.2
NOTCH	8510	4/29	64	25.8	25.0	20.3
PEIR PARK	7150	5/01	42	16.7	21.6	21.3
PALISADE CREEK	4250	4/28	73	31.2	42.4	35.8
PIERSON MEADOWS	7200	4/27	29	9.8	14.0	12.2
PIERSON MEADOWS PILLOW	7200	4/27	SP	10.8	14.3	13.0
PICKET PIN D	9450	4/30	69	25.0A	32.0	32.4
PICKFOOT CREEK	6650	4/25	23	6.5	11.5	-
PICKFOOT CREEK PILLOW	6650	5/01	SP	8.6	11.9	-
PIEGAN PASS #4	5500	4/26	83	36.9	48.9	43.0
PIKE CREEK PILLOW	5930	4/30	SP	17.8	39.3	-
PIPESTONE PASS	7200	4/29	20	6.0	8.6	6.5
PLACER BASIN E	9850	4/30	55	19.5A	27.0	27.1
PLACER BASIN PILLOW	9850	5/02	SP	17.6	18.7	-
POORMAN CREEK	5100	4/28	66	30.4	45.7	33.6
POORMAN CREEK PILLOW	5110	4/28	SP	25.6	43.6	32.1
PORCUPINE	6530	4/26	12	3.3	10.3	8.5
PORCUPINE PILLOW	6530	4/26	SP	2.1	6.6	-
POTOMAGEON PARK	7150	4/27	33	13.4	17.0	12.2
PRAIRIE SAN	5830	4/27	69	27.9	42.5	42.2
[illegible]	6010	4/28	53	20.5	23.2	20.5
[illegible]	5260	4/28	81	35.3	36.8	

SNOW SURVEY DATA
Continued

SNOW May 1, 1983

DRAINAGE BASIN and/or SNOW COURSE NAME	Elevation	THIS YEAR Date of Survey	THIS YEAR Snow Depth (inches)	THIS YEAR Water Content (inches)	PAST RECORD Water Content (inches) Last Year	PAST RECORD Water Content (inches) Average
ROCK CREEK	5600	4/25	13	4.6	6.7	9.1
ROCK CREEK MEADOWS	8160	4/27	60	21.5	32.3	24.5
ROCKER PEAK	8000	4/29	39	12.7	21.2	18.3
ROCKER PEAK PILLOW	8000	4/29	SP	15.7	22.6	19.3
ROCKY BOY	4700	4/30	8	1.6	.0	2.1
ROCKY BOY PILLOW	4700	4/30	SP	1.7	3.7	2.6
SACAJAWEA	6550	4/29	39	14.8	18.1	15.8
SADDLE MOUNTAIN	7940	4/28	65	27.0	37.5	30.0
SADDLE MOUNTAIN PILLOW	7940	4/28	SP	24.8	35.2	30.7
SENTINEL CREEK	8300	4/27	61	26.6	34.1	27.0
SHOWER FALLS	8100	4/28	65	24.1	32.4	32.2
SHOWER FALLS PILLOW	8100	5/01	SP	25.7	33.4	31.9
SILVER RUN	6630	4/26	14	3.9	2.4	4.9
SILVER RUN PILLOW	6630	4/26	SP	3.8	.0	-
SKALKAHO SUMMIT	7260	4/23	57	22.8	37.8	29.3
SKALKAHO SUMMIT PILLOW	7260	5/01	SP	22.5	38.5	-
SKYLARK TRAIL PILLOW	6200	5/01	SP	27.1	49.5	-
SLAG-A-MELT LAKE	8750	4/30	80	33.5	38.4	30.2
SLIDE ROCK MOUNTAIN	7100	4/25	36	12.0	23.2	20.9
SMUGGLER MINE	6960	5/02	31	12.0	13.6	10.8
SOUTH FORK SHIELDS	8100	4/26	56	22.3	32.0	30.2
SOUTH FORK SHIELDS PILLOW	8100	4/26	SP	15.4	21.9	-
SPOTTED BEAR MOUNTAIN	7000	4/30	18	7.5A	17.3	11.7
SPUR PARK	8100	4/28	49	17.2	29.2	26.0
SPUR PARK PILLOW	8100	4/28	SP	19.0	24.8	25.6
STAHL PEAK	6050	4/28	110	44.9	45.6	46.0
STAHL PEAK PILLOW	6050	4/28	SP	39.6	40.1	36.1
STAR LAKE E	9650	4/30	94	41.5A	53.5	51.1
STEMPLE PASS	6600	4/27	24	7.6	14.4	12.0
STORM LAKE	7780	4/27	46	15.4	17.3	17.5
STRYKER BASIN	6180	5/02	84	36.3	41.7	-
STUART MILL	6500	4/28	12	3.3	8.2	5.9
STUART MOUNTAIN	7400	5/01	73	31.3	39.5	36.1
SUCKER CREEK	3960	4/30	0	.0	.0	0.3
TAYLOR ROAD	4080	4/30	0	.0	.0	1.3
TEN MILE LOWER	6600	4/26	19	5.6	10.4	7.1
TEN MILE MIDDLE	6800	4/26	39	11.0	16.4	14.1
TEN MILE UPPER	8000	4/26	43	12.8	19.6	17.1
TEPEE CREEK	8000	4/29	56	21.2	22.6	18.6
TEPEE CREEK PILLOW	8000	4/29	SP	17.1	18.8	14.9
TIMBERLINE CREEK	8850	4/26	57	18.6	17.4	21.3
TRAIL CREEK	7090	4/29	15	4.1	13.0	7.6
TRINKUS LAKE	6100	4/30	93	40.4	53.8	47.6
TV MOUNTAIN	6800	5/01	40	16.6	23.5	21.7
TWELVEMILE CREEK	5600	4/27	21	8.2	27.2	17.4
TWELVEMILE CREEK PILLOW	5600	5/01	SP	4.7	23.5	15.6
TWENTY-ONE MILE	7150	4/29	40	14.7	22.4	18.6
TWIN CREEKS	3580	4/30	0	.0A	9.2	2.7
TWIN LAKES	6510	4/27	79	35.0	60.4	47.4
TWIN LAKES PILLOW	6510	4/27	SP	33.6	56.2	44.3
UPPER HOLLAND LAKE	6200	5/01	59	23.8	44.0	39.5

SNOW May 1, 1983

DRAINAGE BASIN and/or SNOW COURSE NAME	Elevation	THIS YEAR Date of Survey	THIS YEAR Snow Depth (inches)	THIS YEAR Water Content (inches)	PAST RECORD Water Content (inches) Last Year	PAST RECORD Water Content (inches) Average
WALDRON	5600	4/30	6	2.2	12.0	6.1
WALDRON PILLOW	5600	5/01	SP	5.4	10.5	7.8
WARM SPRINGS	7800	4/26	55	19.5	27.5	-
WARM SPRINGS PILLOW	7800	4/26	SP	21.0	30.8	-
WEASEL DIVIDE	5450	4/28	81	35.5	42.2	36.9
WEST YELLOWSTONE	6700	4/29	20	6.5	13.1	9.1
WEST YELLOWSTONE PILLOW	6700	4/29	SP	7.0	10.2	6.8
WHISKEY CREEK	6800	4/28	43	20.3	28.4	19.8
WHISKEY CREEK PILLOW	6800	4/28	SP	17.4	22.8	16.7
WHITE MILL	8700	4/28	68	27.0	37.1	31.9
WHITE MILL PILLOW	8700	4/28	SP	23.9	34.1	28.1
WHITE PINE RIDGE	8850	4/29	23	6.8	9.2	7.0
WILLOW CREEK	6500	4/27	21	5.2	8.3	4.9
WOOD CREEK	5960	5/01	15	5.2	14.0	-
WOOD CREEK PILLOW	5960	5/01	SP	6.1	15.8	-
WRONG CREEK	5700	4/27	22	6.0	16.6	11.4
WRONG RIDGE	6800	4/27	38	13.4	25.0	21.4
IDAHO						
ABOVE BURKE (ID)	4100	4/28	29	13.4	20.6	19.7
BEAR MOUNTAIN (ID)	5400	4/28	141	69.4	83.9	67.7
BEAR MOUNTAIN PILLOW (ID)	5400	5/01	SP	47.7	-	-
BIG SPRINGS (ID)	6500	4/29	38	16.8	20.6	17.7
CRAB CREEK PILLOW (ID)	6960	5/01	SP	26.0	-	-
HUMBOLDT GULCH (ID)	4250	4/28	21	11.0	-	-
HUMBOLDT GULCH PILLOW (ID)	4250	5/01	SP	5.3	-	-
ISLAND PARK (ID)	6200	4/29	32	14.4	15.7	11.4
ISLAND PARK PILLOW (ID)	6200	5/01	SP	15.3	-	-
LOLO PASS (ID)	5230	4/29	34	15.3	33.2	31.4
LOOKOUT (ID)	5250	4/28	69	30.6	40.4	35.4
LOOKOUT PILLOW (ID)	5250	5/01	SP	28.5	-	-
MOOSE CREEK (ID)	6200	4/29	37	14.6	21.2	16.6
MOOSE CREEK PILLOW (ID)	6200	5/01	SP	15.8	-	-
MOSQUITO RIDGE PILLOW (ID)	5200	5/01	SP	39.3	-	-
SAVAGE PASS (ID)	6170	4/29	54	21.7	40.3	29.3
SAWTELL MOUNTAIN (ID)	8220	4/29	116	51.7	56.4	37.1
SMITH CREEK (ID)	4800	4/28	106	51.0	58.0	47.4
SUNSET PILLOW (ID)	5540	5/01	SP	34.0	-	-
TARGHEE PASS (ID)	6230	4/29	36	14.2	17.3	16.2
VALLEY VIEW (ID)	6680	4/29	39	16.3	21.1	14.5
WHITE ELEPHANT (ID)	7210	4/29	74	32.0	38.0	25.2
WYOMING						
BALD MOUNTAIN (WY)	9380	4/26	72	24.1	26.6	31.1
BALD MOUNTAIN PILLOW (WY)	9380	4/26	SP	18.3	-	-
BEARTOOTH LAKE PILLOW (WY)	9270	4/30	SP	23.9	-	-
BURGESS R.S. (WY)	7880	4/27	23	6.1	7.1	11.2
BURGESS R.S. PILLOW (WY)	7880	4/27	SP	12.2	-	-
CANYON PILLOW (WY)	7940	4/30	SP	12.0	24.2	15.4
EAST ENTRANCE (WY)	6960	4/28	13	4.4	7.1	4.0
EVENING STAR PILLOW (WY)	9200	4/30	SP	33.0	-	-
FIVE SPRINGS FALLS (WY)	7620	4/29	9	1.7	4.4	8.3
LAKE CAMP (WY)	7780	4/29	27	8.7	10.6	8.8
NORRIS BASIN (WY)	7500	4/30	18	6.7	13.0	8.6
OLD FAITHFUL (WY)	7400	5/04	27	10.8	17.1	-

SNOW May 1, 1983

DRAINAGE BASIN and/or SNOW COURSE NAME	Elevation	THIS YEAR Date of Survey	THIS YEAR Snow Depth (inches)	THIS YEAR Water Content (inches)	PAST RECORD Water Content (inches) Last Year	PAST RECORD Water Content (inches) Average
PARKERS PEAK PILLOW (WY)	9400	4/30	SP	21.1	-	-
SYLVAN LAKE PILLOW (WY)	8420	4/28	SP	26.5	30.8	-
SYLVAN PASS (WY)	7100	4/28	26	9.8	11.2	11.0
TOGWOTEE PASS (WY)	9590	4/29	80	30.2	45.5	34.4
TROUT CREEK PILLOW (WY)	8400	4/30	SP	9.9	-	-
WOLVERINE (WY)	7650	4/29	29	10.5	14.2	12.3
WOLVERINE PILLOW (WY)	7650	4/29	SP	9.9	-	-
YOUNTS PEAK PILLOW (WY)	8350	4/30	SP	15.8	27.1	-
BRITISH COLUMBIA						
BEAVERFOOT (BC)	6200	4/26	24	7.1	10.9	9.4
FERNIE (BC)	3510	4/29	0	.0	6.0	2.4
FERNIE EAST (BC)	4100	4/29	26	10.6	15.8	8.3
FERNIE NE (BC)	3510	4/29	4	1.3A	9.9	4.4
FIDELITY MOUNTAIN (BC)	6130	4/26	89	37.2	54.9	55.1
FIELD (BC)	4200	4/29	0	.0A	5.2	1.3
FLOE LAKE (BC)	6860	4/27	60	24.6	36.5	34.3
GLACIER (BC)	4100	4/28	45	19.6	34.1	28.2
GRAY CREEK LOWER (BC)	5080	4/29	43	15.6	22.3	19.9
GRAY CREEK UPPER (BC)	6260	4/28	69	27.5	37.2	34.4
KICKING HORSE (BC)	5410	4/29	26	9.9	16.3	12.8
KIMBERLEY LOWER VOR (BC)	4490	4/27	0	.0	5.8	1.5
KIMBERLEY MIDDLE VOR (BC)	5510	4/27	28	9.4	13.7	10.7
KIMBERLEY UPPER VOR (BC)	7020	4/27	54	17.6	22.7	22.4
MARBLE CANYON (BC)	4990	4/30	29	9.1	14.2	12.9
MORRISSEY RIDGE (BC)	6100	4/28	66	29.2	31.6	29.0
MOUNT ABBOT (BC)	6490	4/25	108	46.5	60.6	55.6
MOUNT ASSINIBOINE (BC)	7310	4/27	59	19.2	26.1	24.6
MOUNT JOFFRE (BC)	5740	4/27	39	13.0	18.2	15.7
MOYIE MOUNTAIN (BC)	6360	4/28	41	16.9	16.4	17.2
SINCLAIR PASS (BC)	4490	4/28	5	1.3	5.4	2.5
SULLIVAN MINE (BC)	5080	4/28	29	9.7	14.7	11.7
THUNDER CREEK (BC)	6590	4/27	33	8.2	12.4	12.9
UPPER ELK RIVER (BC)	4400	4/28	0	.0	4.4	1.1
VERMONT CREEK (BC)	4990	2/27	35	14.6	24.8	20.7
ALBERTA						
AKAMINA (AL)	5810	4/26	46	18.8	27.2	-
ALLISON PASS (AL)	6490	4/26	46	15.1	21.0	-
BOW RIVER SUMMIT (AL)	6660	4/27	37	12.6	15.6	14.6
CUTHEAD LAKE (AL)	7250	4/27	45	12.3	18.3	17.0
HIGHWOOD SUMMIT BUSH (AL)	7250	4/26	61	16.2	18.8	19.6
KATHERINE LAKE (AL)	7810	4/27	44	11.2	21.3	20.5
LARCH VALLEY (AL)	7740	4/27	49	16.3	21.5	-
LITTLE ELBOW SUMMIT (AL)	7090	4/26	60	15.5	15.1	13.0
MIST CREEK (AL)	5740	4/26	25	7.0	9.2	7.9
MOUNT SKOKI (AL)	6740	4/27	41	13.3	16.3	14.7
MUD LAKE (AL)	6200	4/26	47	13.1	18.9	14.6
NIGEL CREEK (AL)	6400	4/28	35	13.1	16.0	17.3
PTARMIGAN HUT (AL)	7150	4/27	34	11.6	17.5	16.0
SUNSHINE VILLAGE (AL)	7300	4/25	57	18.0	28.7	26.3
SUNWAPTA FALLS (AL)	4590	4/28	2	.5	7.8	6.9
THREE ISLE LAKE (AL)	7090	4/26	68	22.6	29.0	-

Average based on 1963-77 period. A - Aerial observation; water content estimated.
SP - Snow Pillow observations; water content only.

SNOTEL (snow survey telemetry) sites provide daily information on the water content of the snowpack, total precipitation and air temperature from remote areas in mountain watersheds. These sites are located in main water-producing areas and provide both geographic coverage as well as elevational differences. There are now 65 operational SNOTEL sites in Montana.

Columbia River Drainage

STREAMFLOW FORECASTS

BASIN, STREAM and/or FORECAST POINT	THIS YEAR FORECAST MAY - September Thousand Acre Feet	THIS YEAR FORECAST MAY - September Percent of Average	[illegible]	[illegible]	THIS YEAR FORECAST May - July Thousand Acre Feet	THIS YEAR FORECAST May - July Percent of Average	PAST RECORD THOUSAND ACRE FEET May - July Last Year	PAST RECORD THOUSAND ACRE FEET May - July Average	THIS YEAR FORECAST May - June Thousand Acre Feet	THIS YEAR FORECAST May - June Percent of Average	PAST RECORD THOUSAND ACRE FEET May - June Last Year	PAST RECORD THOUSAND ACRE FEET May - June Average
KOOTENAI RIVER below Libby Dam (1)	6,580	97	6,685	6,814	5,500	96	5,546	5,746				
FISHER RIVER near Libby	153	77		199	140	77		183				
YAAK RIVER near Troy	375	86		434	350	85		411				
KOOTENAI RIVER at Leonia (1)	7,620	94	8,063	8,116	6,520	93	6,833	6,966	5,020	93	5,341	5,402
INFLOW MOULTON RESERVOIR nr BUTTE (Million Gallons)					165	67	353	248	145	65	332	222
WARM SPRINGS CREEK AT MEYERS DAM near Anaconda (2)	40.4	84		48.1	32.5	84		38.6				
FLINT CREEK near Southern Cross (3)	11.6	71	22.8	16.4	9.5	71	18.2	13.4				
FLINT CREEK below Boulder Creek (4)	49.0	70		70.1	37.0	69		53.5				
INFLOW LOWER WILLOW CREEK RESERVOIR near Hall (5)	8.9	62	14.8	14.3	8.0	59	13.6	13.5				
MIDDLE FORK ROCK CREEK near Philipsburg	61.5	82		74.9	55.0	82		67.1				
NEVADA CREEK near Finn	11.0	57		19.3	9.5	54		17.5				
BLACKFOOT RIVER near Bonner	660	73		899	575	72		802	490	72		676
CLARK FORK RIVER above Milltown (6)	590	80		734	490	79		621	400	79		505
CLARK FORK RIVER above Missoula	1,250	77	2,041	1,633	1,065	75	1,820	1,423	890	75	1,426	1,180
WEST FORK BITTERROOT RIVER near Conner (7)	114	67		170	102	66		155				
BITTERROOT RIVER near Darby	360	66		549	330	66		499	280	66		427
SKALKAHO CREEK near Hamilton	42.8	79		54.5	36.5	78		47.0				
BURNT FORK CREEK near Stevensville (8)	29.5	80		36.8	25.0	79		31.7				
BITTERROOT RIVER at Missoula (9)	950	67		1,409	865	67		1,282	720	67		1,075
CLARK FORK RIVER below Missoula	2,200	72		3,042	1,930	71		2,705	1,610	71		2,255
CLARK FORK RIVER at St. Regis	2,740	68	5,152	4,001	2,410	68	4,729	3,557	2,020	68	3,746	2,971
NORTH FORK FLATHEAD RIVER near Columbia Falls	1,470	81		1,809	1,320	81		1,622	1,100	82		1,338
MIDDLE FORK FLATHEAD RIVER near West Glacier	1,310	75	1,978	1,756	1,190	75	1,820	1,595	995	76	1,439	1,315
SOUTH FORK FLATHEAD RIVER near Columbia Falls (10)	1,500	72	2,381	2,076	1,400	72	2,250	1,934	1,200	72	1,856	1,659
FLATHEAD RIVER at Columbia Falls (10)	4,370	76	6,163	5,773	4,030	76	5,694	5,270	3,400	77	4,603	4,405
SWAN RIVER near Big Fork	510	86		595	440	86		510				
FLATHEAD RIVER near Polson (11)	5,200	78	7,495	6,692	4,760	78	6,813	6,105	3,950	78	5,400	5,079
CLARK FORK RIVER near Plains (11)	7,860	71	13,022	10,570	7,050	71	11,858	9,953	5,850	71	9,366	8,238
THOMPSON RIVER near Thompson Falls	177	80		219	151	79		191				
PROSPECT CREEK at Thompson Falls	95.0	82		116	86.0	81		106				
CLARK FORK RIVER at Whitehorse Rapids (12)	8,960	73		12,207	7,990	73		10,945	6,620	73		9,059

(1) Adjusted for storage in Lake Koocanusa
(2) Adjusted for storage in Silver Lake, diversions to and pumping from Georgetown Lake.
(3) Adjusted for storage in Georgetown Lake, diversions from and pumping to Silver Lake.
(4) Sum Flint Creek at Maxville and Boulder Creek at Maxville.
(5) Sum of North Fork Lower Willow Creek near Hall and South Fork Lower Willow Creek near Hall.
(6) Difference in observed flow Clark Fork above Missoula and Blackfoot near Bonner
(7) Adjusted for storage in Painted Rocks Reservoir.
(8) Adjusted for diversion into Sunset Highline Canal.
(9) Difference in observed flow Clark Fork above and below Missoula.
(10) Adjusted for storage in Hungry Horse Reservoir
(11) Adjusted for storage in Hungry Horse Reservoir and Flathead Lake
(12) Adjusted for storage in Hungry Horse Reservoir, Flathead Lake and Noxon Rapids Reservoir.

ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

SUMMARY of SNOW MEASUREMENTS

(COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN and/or SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF Last Year	THIS YEAR'S SNOW WATER AS PERCENT OF Average
East Kootenay/BC.	24	67	76
Kootenai/Montana	25	74	93
Kootenai above Bonners Ferry...	49	71	86
Little Bitterroot	5	53	72
N. Fk. Flathead..	8	86	91
M. Fk. Flathead..	9	60	71
S. Fk. Flathead..	11	76	86
Swan	9	81	88
Flathead	42	75	84
Stillwater & Whitefish.....	5	69	89
Clark Fork above Blackfoot	34	61	77
Blackfoot	21	51	63
Upper Clark Fork above Missoula .	55	57	71
Bitterroot	18	57	74
Lower Clark Fork below Missoula .	17	65	77
Clark Fork (Total w/o Flathead)...	90	59	74
Pend O'Reille (Clark Fork & Flathead)	132	65	78
Columbia (Pend O'Reille & Kootenai)	139	64	78

WATER SUPPLY OUTLOOK

Expressed as "Poor, Fair, Average, Excellent" With Respect to Usual Supply

STREAM or AREA	Flow Period: Spring Season	Flow Period: Late Season
Tobacco	Avg	Fair
Little Bitterroot....	Fair	Fair
Mission Valley	Fair	Fair
Flint Creek	Fair	Poor
Upper Clark Fork	Fair	Poor
Nevada Creek	Fair	Poor
Blackfoot	Fair	Poor
West-side Bitterroot	Fair	Poor
East-side Bitterroot	Fair	Fair
Bitterroot River	Fair	Poor
Lower Clark Fork	Fair	Poor

Streamflow forecasts are lowered

Almost all irrigated areas west of the Divide can expect below to well below average runoff. Streamflow forecasts decreased in most areas to reflect deficient mountain moisture during April. May through September runoff is generally forecast to be in the 70 to 80 percent range for most streams and rivers.

Irrigation water supply shortages are expected to develop by mid-June in many areas possibly becoming severe by early to mid-July. Without good high elevation snowpack, all streams will drop rapidly soon after peak runoff.

Peak snowmelt runoff on the Blackfoot, Clark Fork, and Middle Fork Flathead Rivers, is expected to be less than average and should occur soon after mid-May. The Bitterroot and North Fork Flathead should reach their peak snowmelt runoff a little later in May. Some smaller drainages with lower elevation headwaters have already reached or are near their peak snowmelt runoff.

Most areas below average

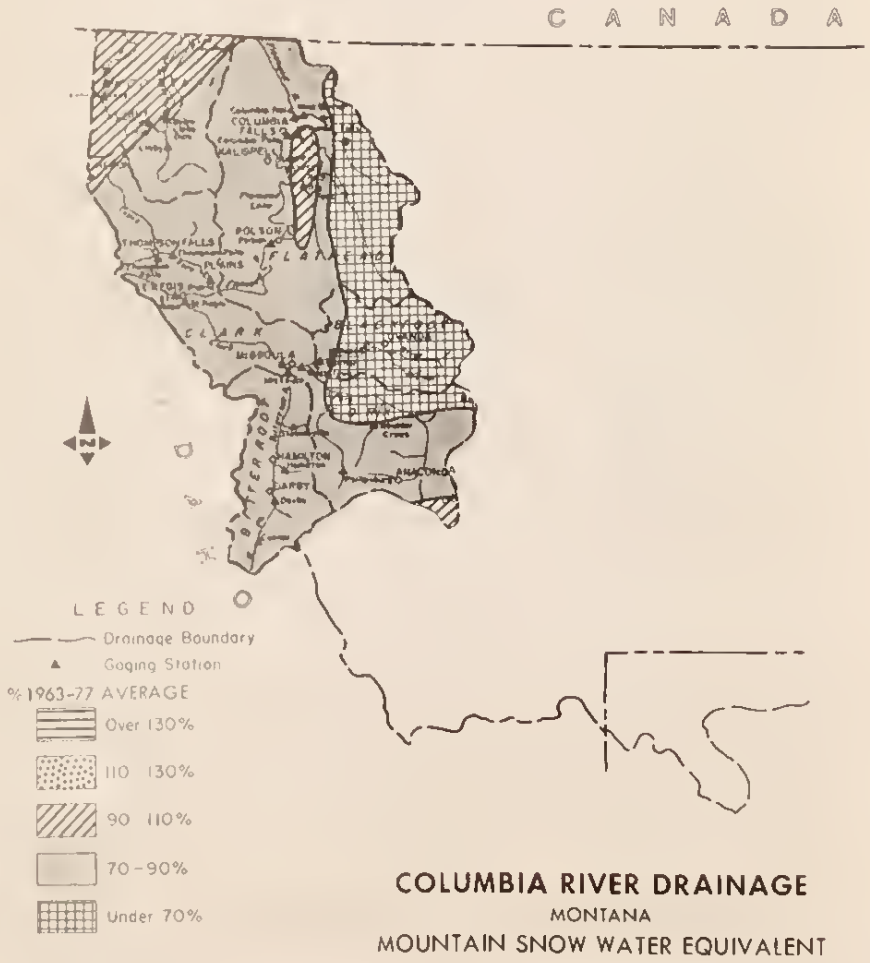
Only portions of the Kootenai River, the northern end of the Swan and Mission Mountain Ranges, and a small area south of Butte show near average snowpack. All other areas have below average to well below average water levels stored in the mountain snowpack. Except for near normal precipitation in some northwestern mountains, the April precipitation was below average in mountain watersheds. Also, most low and middle elevation snow courses as well as a few high elevation areas showed melt during April. Snow pillows indicate most SNOTEL sites reached their maximum water content of the season near mid-April.

PEAK FLOWS (MAXIMUM MEAN DAILY) (Average flow for 24 hrs. on day of greatest flow)

FORECAST POINT	PEAK FLOW (SECOND FEET) Forecast Range	PEAK FLOW (SECOND FEET) Average
COLUMBIA RIVER DRAINAGE		
Blackfoot River near Bonner	6,000 - 8,000	9,902
Clark Fork River above Missoula	9,000 - 13,000	10,531
Bitterroot River near Darby	3,500 - 5,500	6,650
Clark Fork River below Missoula	18,000 - 26,000	32,373
Clark Fork River at St. Regis	25,000 - 35,000	41,080
N. Fk. Flathead near Columbia Falls	14,000 - 18,000	23,167
M. Fk. Flathead near West Glacier	10,000 - 15,000	25,020

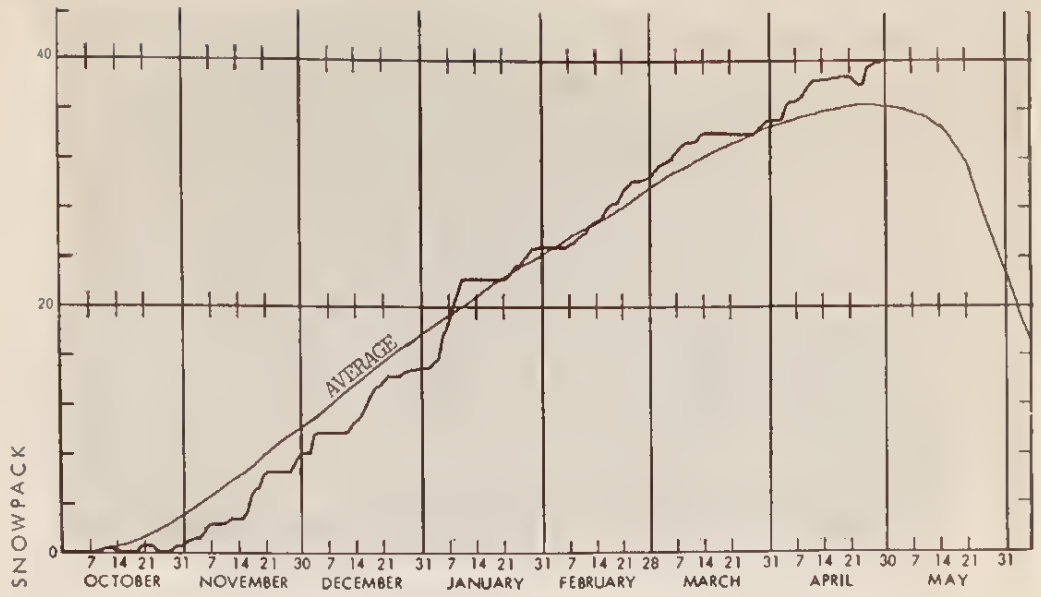
*Highly abnormal weather during the critical melting period may cause the peak to be outside the indicated range.

Average based on 1963-77 period.

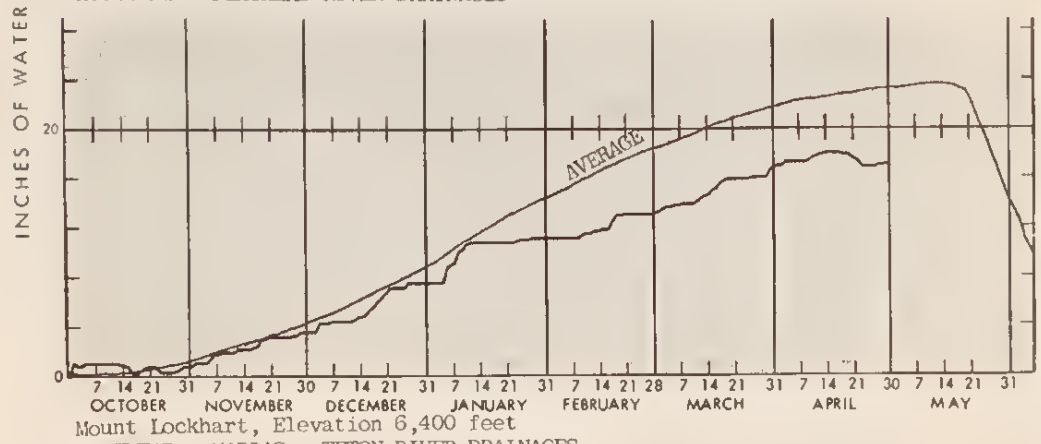


COLUMBIA RIVER DRAINAGE
MONTANA
MOUNTAIN SNOW WATER EQUIVALENT

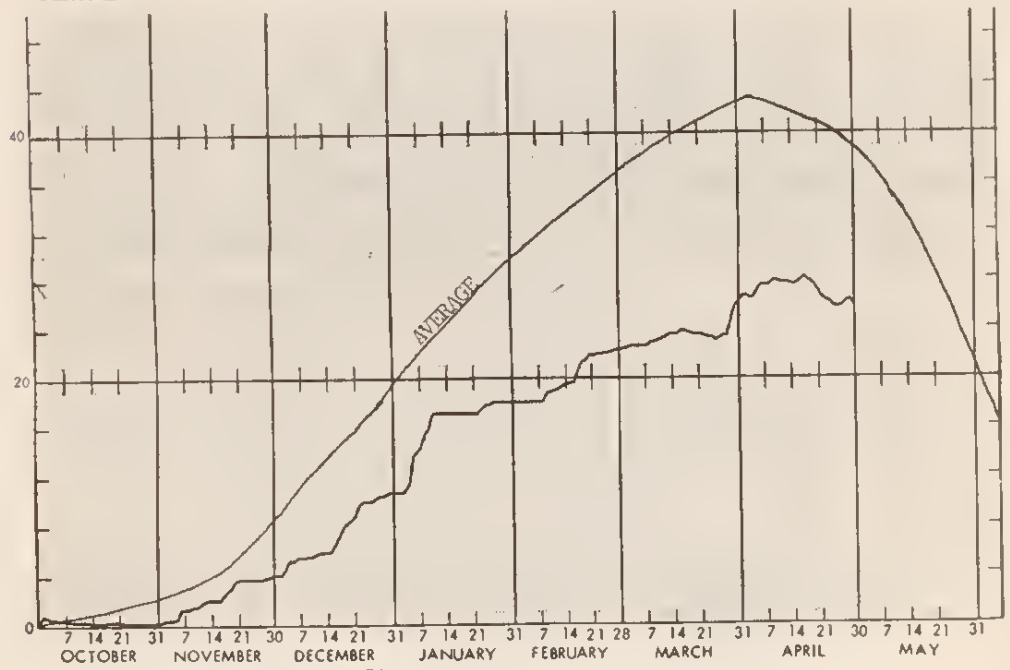
SNOW PILLOW DATA


INCHES OF WATER IN SNOWPACK
0
20
40
AVERAGE
7 14 21 31 7 14 21 30 7 14 21 31 7 14 21 31 7 14 21 28 7 14 21 31 7 14 21 30 7 14 21 31
OCTOBER NOVEMBER DECEMBER JANUARY FEBRUARY MARCH APRIL MAY

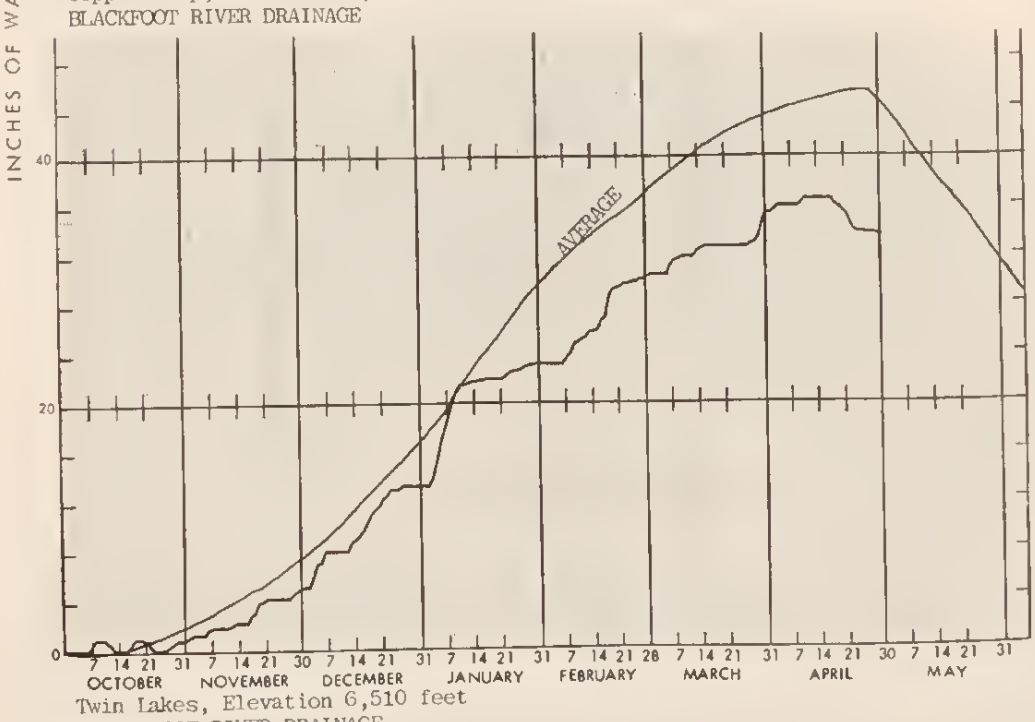
Stahl Peak, Elevation 6,030 feet
KOOTENAI - FLATHEAD RIVER DRAINAGES


INCHES OF WATER IN SNOWPACK
0
20
AVERAGE
7 14 21 31 7 14 21 30 7 14 21 31 7 14 21 31 7 14 21 28 7 14 21 31 7 14 21 30 7 14 21 31
OCTOBER NOVEMBER DECEMBER JANUARY FEBRUARY MARCH APRIL MAY

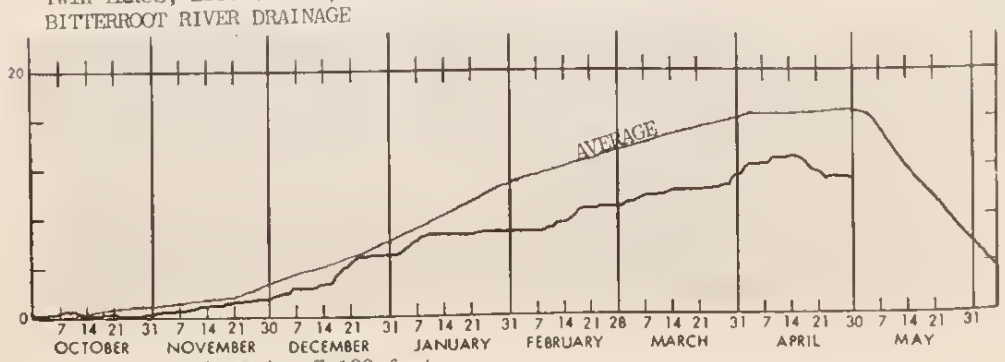
Mount Lockhart, Elevation 6,400 feet
FLATHEAD - MARIAS - TETON RIVER DRAINAGES


INCHES OF WATER IN SNOWPACK
0
20
40
AVERAGE
7 14 21 31 7 14 21 30 7 14 21 31 7 14 21 31 7 14 21 28 7 14 21 31 7 14 21 30 7 14 21 31
OCTOBER NOVEMBER DECEMBER JANUARY FEBRUARY MARCH APRIL MAY

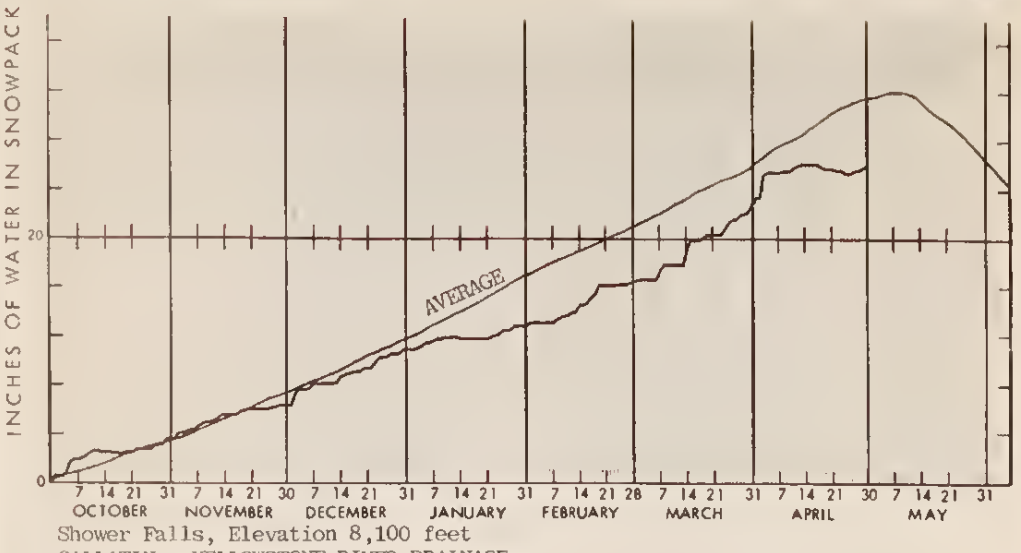
Copper Camp, Elevation 6,950 feet
BLACKFOOT RIVER DRAINAGE


INCHES OF WATER IN SNOWPACK
0
20
40
AVERAGE
7 14 21 31 7 14 21 30 7 14 21 31 7 14 21 31 7 14 21 28 7 14 21 31 7 14 21 30 7 14 21 31
OCTOBER NOVEMBER DECEMBER JANUARY FEBRUARY MARCH APRIL MAY

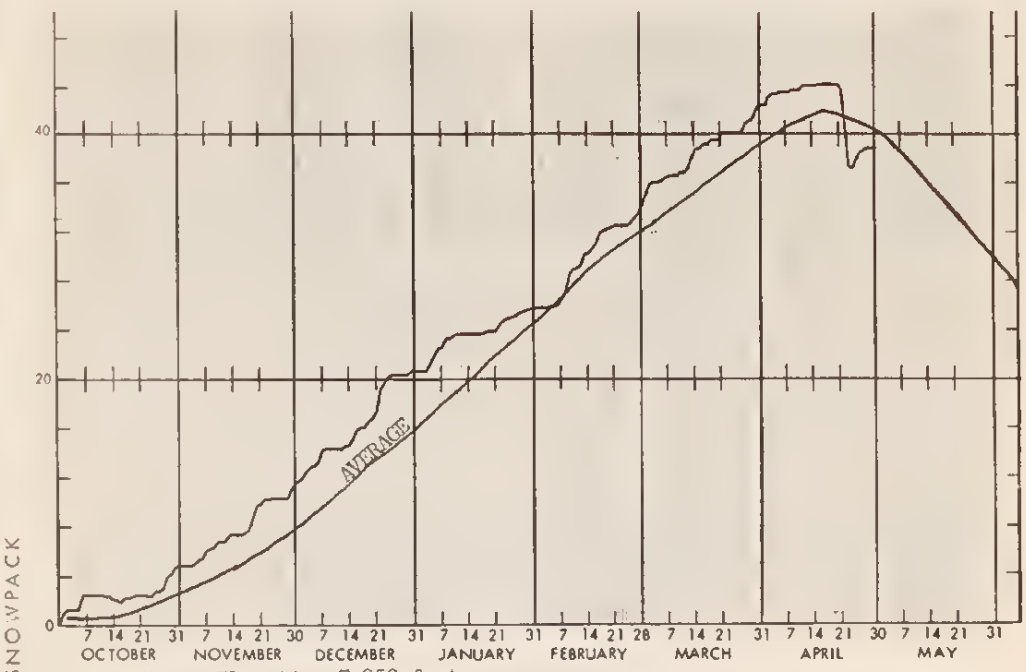
Twin Lakes, Elevation 6,510 feet
BITTERROOT RIVER DRAINAGE



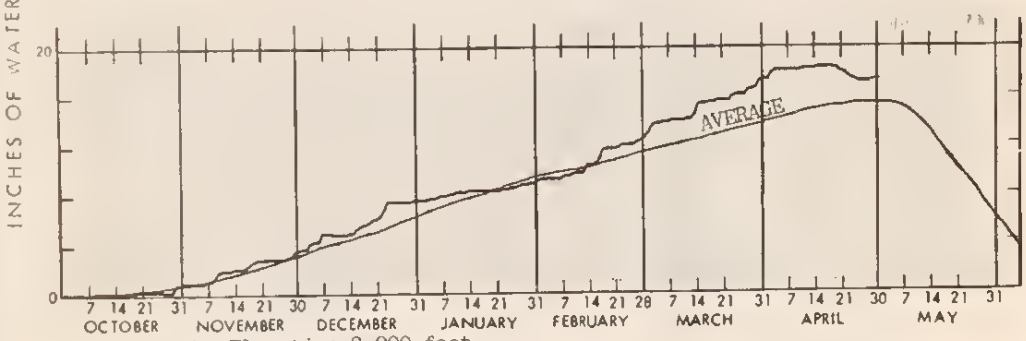
Black Pine, Elevation 7,100 feet
UPPER CLARK FORK RIVER DRAINAGE


INCHES OF WATER IN SNOWPACK
0
20
AVERAGE
7 14 21 31 7 14 21 30 7 14 21 31 7 14 21 31 7 14 21 28 7 14 21 31 7 14 21 30 7 14 21 31
OCTOBER NOVEMBER DECEMBER JANUARY FEBRUARY MARCH APRIL MAY

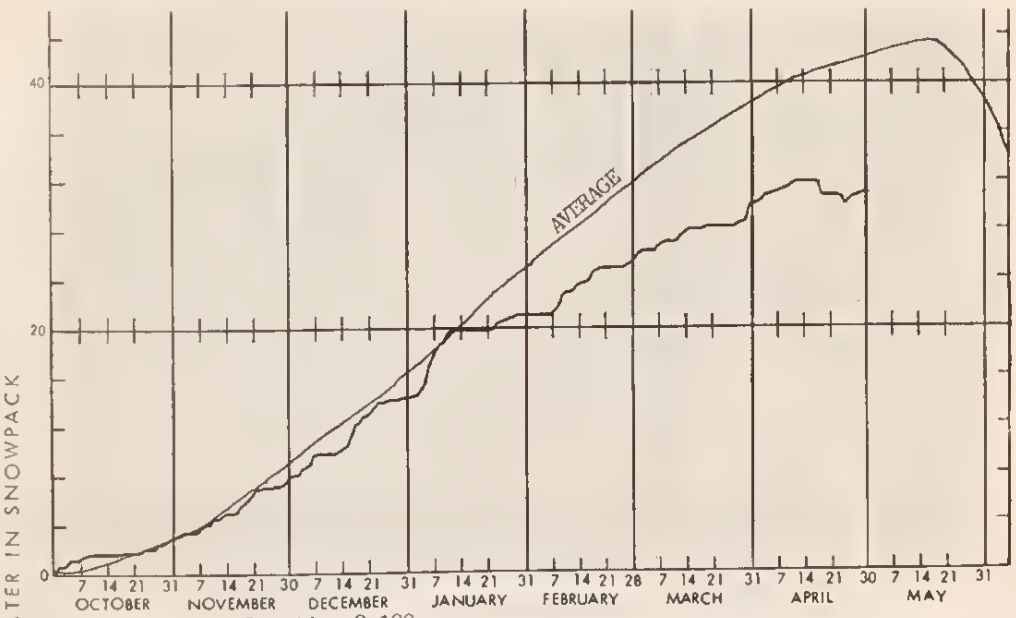
Shower Falls, Elevation 8,100 feet
GALLATIN - YELLOWSTONE RIVER DRAINAGE


INCHES OF WATER IN SNOWPACK
0
20
40
AVERAGE
7 14 21 31 7 14 21 30 7 14 21 31 7 14 21 31 7 14 21 28 7 14 21 31 7 14 21 30 7 14 21 31
OCTOBER NOVEMBER DECEMBER JANUARY FEBRUARY MARCH APRIL MAY

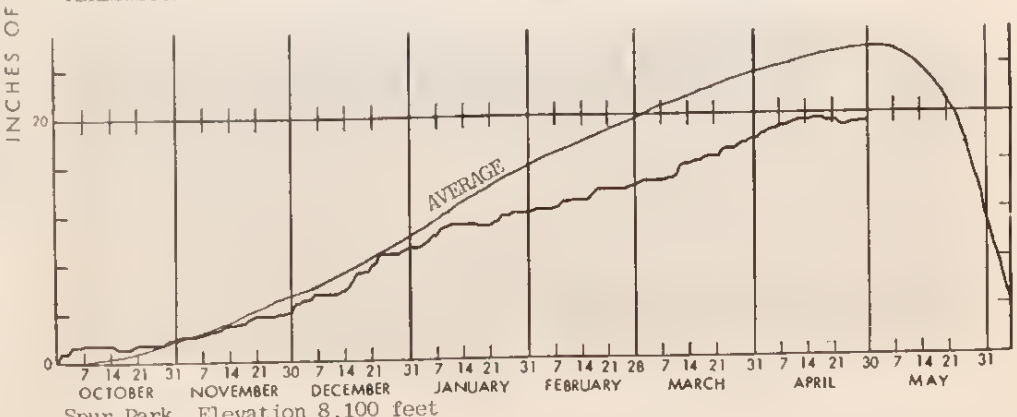
Black Bear, Elevation 7,950 feet
MADISON RIVER DRAINAGE


INCHES OF WATER IN SNOWPACK
0
20
AVERAGE
7 14 21 31 7 14 21 30 7 14 21 31 7 14 21 31 7 14 21 28 7 14 21 31 7 14 21 30 7 14 21 31
OCTOBER NOVEMBER DECEMBER JANUARY FEBRUARY MARCH APRIL MAY

Tepee Creek, Elevation 8,000 feet
MADISON - BEAVERHEAD - RUBY RIVER DRAINAGES


INCHES OF WATER IN SNOWPACK
0
20
40
AVERAGE
7 14 21 31 7 14 21 30 7 14 21 31 7 14 21 31 7 14 21 28 7 14 21 31 7 14 21 30 7 14 21 31
OCTOBER NOVEMBER DECEMBER JANUARY FEBRUARY MARCH APRIL MAY

Fisher Creek, Elevation 9,100
YELLOWSTONE - BOULDER - STILLWATER - CLARK'S FORK RIVER DRAINAGES


INCHES OF WATER IN SNOWPACK
0
20
AVERAGE
7 14 21 31 7 14 21 30 7 14 21 31 7 14 21 31 7 14 21 28 7 14 21 31 7 14 21 30 7 14 21 31
OCTOBER NOVEMBER DECEMBER JANUARY FEBRUARY MARCH APRIL MAY

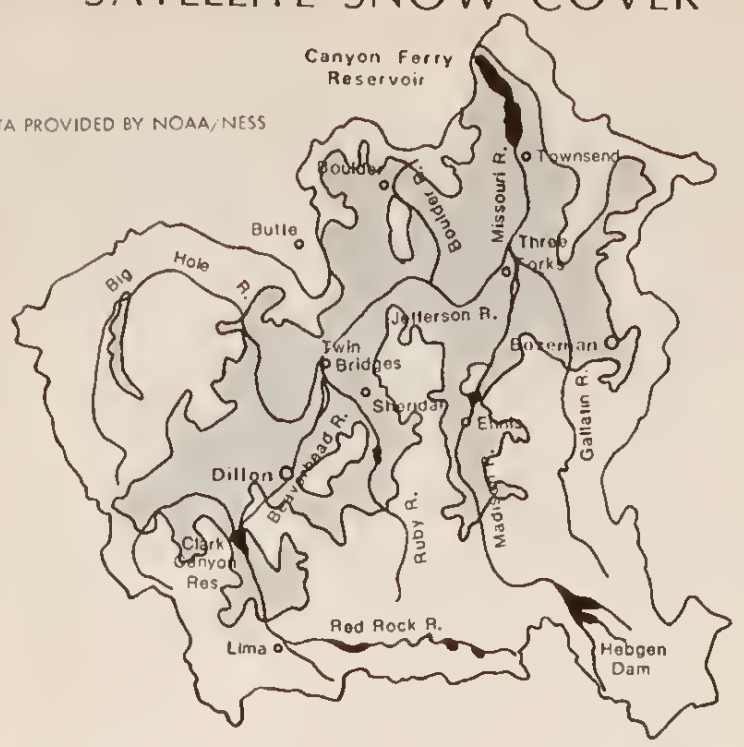
Spur Park, Elevation 8,100 feet
JUDITH RIVER DRAINAGE

RESERVOIR STORAGE (Thousand Acre Feet) END OF MONTH April 30, 1983

Basin or Stream	RESERVOIR	Usable Capacity	Usable Storage: This Year	Usable Storage: Last Year	Usable Storage: Average
	COLUMBIA				
Kootenai	Koocanusa	5,748.2	2,220.0	1,597.0	---
Flathead	Hungry Horse	3,451.0	2,507.0	1,884.0	1,896.0
	Flathead Lake	1,791.0	950.8	943.6	915.3
	Camas (4)	45.2	36.4	32.0	28.6
	Mission Valley (8)	100.3	54.2	31.9	47.4
Clark Fork	Georgetown Lake	31.0	25.2	26.1	23.6
	Lower Willow Creek	4.9	3.3	5.0	2.7
	Nevada Creek	12.6	9.9	9.9	10.2
	Noxon Rapids	334.6	312.8	321.9	141.7
Bitterroot	Painted Rocks	31.7	---	---	21.3
	Como	34.9	---	---	17.8
	MISSOURI				
Beaverhead	Lima	84.0	55.2	48.9	57.1
	Clark Canyon	257.2	184.4	180.4	152.7
Ruby	Ruby	38.8	36.3	36.4	35.4
Madison	Hebgen Lake	377.5	222.3	236.3	239.5
	Ennis Lake	41.0	37.1	31.3	35.9
Gallatin	Middle Creek	8.0	4.3	---	4.5
Missouri	Canyon Ferry	2,043.0	1,568.0	1,404.0	1,504.0
	Hauser & Helena	61.9	62.5	61.3	61.2
	Lake Helena	10.4	10.7	10.2	10.4
	Holter Lake	81.9	80.5	81.0	72.9
	Fort Peck Lake	18,910.0	15,790.0	14,250.0	15,700.0
Smith	Smith River	10.6	10.5	10.8	9.3
	Newlan Creek	12.4	9.0	10.9	---
Musselshell	Bair	7.0	6.8	6.7	6.4
	Martinsdale	23.1	18.8	12.8	12.3
	Deadman's Basin	72.2	68.3	62.8	56.8
Sun	Gibson	99.1	66.2	58.6	48.6
	Willow Creek	32.2	24.8	25.9	24.1
	Pishkun	32.0	30.3	25.7	24.7
Marias	Lower Two Medicine	11.9	---	11.7	9.2
	Four Horns	19.2	---	14.9	12.6
	Swift	30.0	19.2	13.6	17.6
	Lake Frances	111.9	85.6	83.0	77.5
Milk	Elwell (Tiber)	1,347.0	714.9	594.8	563.1
	Beaver Creek	3.5	3.1	3.2	2.6
	Fresno	127.2	69.9	116.3	104.8
	Nelson	66.8	44.8	47.5	46.9
	HUDSON BAY				
St. Mary's	Lake Sherburne	64.3	8.8	22.7	22.7
	YELLOWSTONE				
Stillwater	Mystic Lake	21.0	---	---	2.6
Clark's Fork	Cooney	27.4	22.4	12.5	19.1
Tongue	Tongue River	68.0	17.3	15.4	42.3
Bighorn	Bighorn Lake	1,356.0	874.0	757.0	585.8

SATELLITE SNOW COVER

DATA PROVIDED BY NOAA/NESS



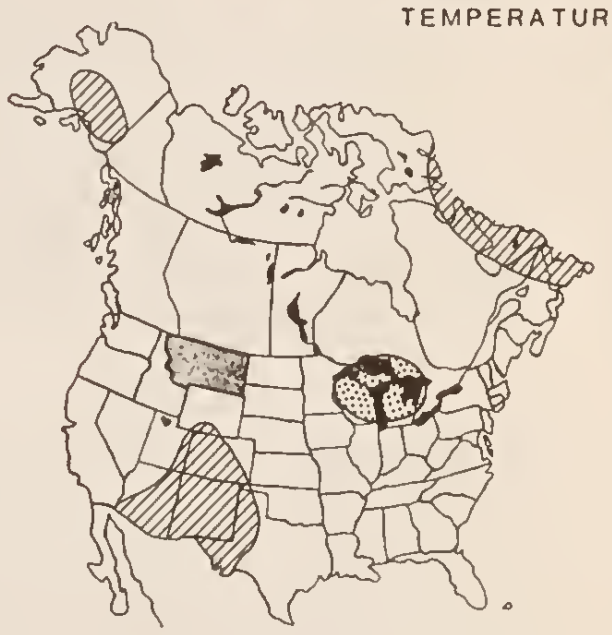
Snow Covered Area

Scale 1:2,500,000

MISSOURI RIVER BASIN
Above
Canyon Ferry Dam

DATE	PERCENT SNOW COVER	AVERAGE SNOWLINE ELEVATION IN FEET
November 14, 1982	81	5290
November 1982	96	4300
November 24, 1982	95	4380
December 24, 1982	100	3800
January 18, 1983	76	5540
January 25, 1983	71	5770
February 3, 1983	76	5540
February 24, 1983	72	5720
March 10, 1983	65	6040
March 21, 1983	71	5770
March 26, 1983	72	5720
April 6, 1983	80	5340
April 17, 1983	58	6330

TEMPERATURE



PRECIPITATION

BELOW
NORMAL
ABOVE

average monthly weather outlook
FOR MAY 1983

LIGHT
MODERATE
HEAVY

AGENCIES AND ORGANIZATIONS COOPERATING IN MONTANA SNOW SURVEYS

GOVERNMENT AGENCIES
- Canada
  - Department of the Environment
    - Atmospheric Environment Service
    - Water Management Service
  - British Columbia Ministry of Environment
    - Inventory and Engineering Branch, Hydrology Section
  - Alberta Environment
    - Technical Services Division
- Federal
  - Department of the Army - Corps of Engineers
  - Department of Agriculture - Forest Service
  - Soil Conservation Service
  - Department of Commerce - National Environmental Satellite Service
  - National Weather Service
  - Department of Interior - Bureau of Indian Affairs
  - Fish and Wildlife Service
  - Geological Survey
  - National Park Service
  - Bureau of Reclamation
  - Department of Energy - Bonneville Power Administration

STATE AGENCIES
- Montana Conservation Districts
- Montana Department of Fish, Wildlife and Parks
- Montana Department of Natural Resources and Conservation
- Montana State University - Agricultural Experiment Station
- University of Montana - School of Forestry

PRIVATE ORGANIZATIONS
- The Anaconda Company
- Big Sky of Montana
- Butte Water Company
- Flathead Valley Community College
- Montana Power Company

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

U.S. GOVERNMENT PRINTING OFFICE
1983 693-047